

WHAT IS CLAIMED IS:

1. A system in an asynchronous mobile communications system and located in a mobile station for determining use of space-time block-coding-based transmit diversity encoding in a base station that includes two transmission antennas, the system comprising:

a cell search unit for detecting frame timing information and scrambling codes of the base station from signals output from the base station;

a descrambling unit for descrambling the signals output from the base station using the frame timing information and the scrambling codes, which are detected by the cell search unit;

an accumulation processor for despread the signals descrambled by the descrambling unit;

a depatternization unit for performing depatternization of the signals despread by the logic processor using pilot symbol patterns corresponding to the two transmission antennas of the base station; and

an accumulator bank unit for performing accumulation and addition processes of the signals that have undergone depatternization by the depatternization unit to output signals corresponding to the transmission antennas.

2. The system of claim 1 wherein the descrambling unit comprises:

a scrambling code generator for generating scrambling codes that are synchronized with the frame timing of the base station using the frame timing information and the scrambling code detected by the cell search unit; and

a multiplying processor for multiplying the scrambling codes generated

by the scrambling code generator by the signals output by the base station.

3. The system of claim 1 wherein the depatternization unit comprises:

a symbol pilot generator for generating pilot symbol patterns corresponding to the two transmission antennas of the base station; and

5 a multiplier for multiplying each of the pilot symbol patterns generated by the symbol pilot generator by the signals despread by the accumulation processor.

4. The system of claim 1 wherein the accumulator bank unit comprises:

a first accumulator for accumulating each signal, which has undergone depatternization by the depatternization unit, at every predetermined number of symbols, the predetermined number corresponding to a predetermined depatternization length;

a non-coherent adding unit receiving input of each signal accumulated by the first accumulator, and adding and outputting signals having in-phase and
15 quadrature-phase elements; and

a second accumulator receiving each of the signals output by the non-coherent adding unit, accumulating the signals by as much as a predetermined accumulation length, and outputting the signals as signals corresponding to each of the two transmission antennas.

20 5. The system of claim 1 wherein the cell search unit uses, among channels transmitted from the base station, a common pilot channel to detect the frame timing information and the scrambling codes of the base station.

6. The system of claim 1 wherein the pilot symbol patterns used by the depatternization unit are orthogonal to one another.

7. The system of claim 1 wherein energy values of the signals corresponding to the two transmission antennas and output from the accumulator bank unit are compared to determine if space-time block-coding-based transmit diversity encoding of the base station is being used.

5 8. A method in an asynchronous mobile communications system for determining use of space-time block-coding-based transmit diversity encoding in a base station comprising:

(a) detecting scrambling codes through a common pilot channel transmitted from the base station which includes two transmission antennas;

(b) generating pilot symbols using the detected scrambling codes;

(c) performing depatternization of the generated pilot symbols using pilot symbol patterns corresponding to each of the two transmission antennas;

(d) performing accumulation and addition processes of the two pilot symbols having undergone depatternization, and outputting the symbols as signals corresponding to each of the two transmission antennas; and

(e) comparing energy values of the two output signals corresponding to the transmission antennas to determine if space-time block-coding-based transmit diversity encoding of the base station is being used.

9. The method of claim 8 wherein step (b) comprises:

(i) descrambling signals transmitted from the base station using the scrambling codes detected in step (a); and

(ii) generating pilot symbols by performing despreading of the signals descrambled in step (i).

10. The method of claim 8 wherein step (c) comprises:

(i) generating pilot symbols using pilot symbol patterns corresponding to each of the two transmission antennas; and

(ii) multiplying each of the pilot symbol patterns generated in step (i) by the pilot symbols generated in step (b).

5 11. The method of claim 8 wherein step (d) comprises:

(i) accumulating the two pilot symbols having undergone depatternization in step (c) at every predetermined number of symbols, the predetermined number corresponding to a predetermined depatternization length;

10 (ii) receiving the signals accumulated in step (i), and adding signals having in-phase and quadrature-phase elements; and

(iii) accumulating the signals added in step (ii) by as much as a predetermined accumulation length, and outputting the signals as signals corresponding to each of the two transmission antennas.

15 12. The method of claim 1 wherein the pilot symbol patterns used in step (c) are orthogonal to one another.

20 13. A system in an asynchronous mobile communications system and located in a mobile station for determining use of space-time block-coding-based transmit diversity encoding in a base station that includes two transmission antennas, the system comprising:

a cell search unit for detecting frame timing information and scrambling codes of the base station from signals output from the base station;

a descrambling unit for descrambling the signals output from the base station using the frame timing information and the scrambling codes, which are

detected by the cell search unit;

an accumulation processor for despread the signals descrambled by the descrambling unit;

a depatternization unit for performing depatternization of the signals despread by the accumulation processor using pilot symbol patterns corresponding to the two transmission antennas of the base station;

two or more accumulator bank units for performing accumulation and addition processes of the signals that have undergone depatternization by the depatternization unit to output signals corresponding to the two transmission antennas, depatternization lengths of each of the two or more accumulator bank units being different; and

a final determining unit receiving the signals corresponding to the two transmission antennas and output by the two or more accumulator bank units in order to perform a final determination of whether space-time block-coding-based transmit diversity encoding of the base station is being used.

14. The system of claim 13 wherein each of the two or more accumulator bank units comprises:

a first accumulator for accumulating each signal, which has undergone depatternization by the depatternization unit, at every predetermined number of symbols, the predetermined number corresponding to a predetermined depatternization length;

a non-coherent adding unit receiving input of each signal accumulated by the first accumulator, and adding and outputting signals having in-phase and quadrature-phase elements; and

a second accumulator receiving each of the signals output by the non-coherent adding unit, accumulating the signals by as much as a predetermined accumulation length, and outputting the signals as signals corresponding to each of the two transmission antennas.

5 15. The system of claim 13 wherein the final determining unit comprises:

two or more comparator switches, each comparing the two signals output by the two or more accumulation bank units to each output the signals through different paths according to size of the signals;

10 two or more critical value multipliers for multiplying a signal of a small size output from the two or more comparator switches by a predetermined critical value;

15 two or more comparators for comparing a signal of a large size output from the two or more comparator switches with a signal output from the critical value multipliers, and outputting a comparison result value; and

a logical OR gate for performing a logical OR calculation of comparison values output from each of the two or more comparators to output a final determination signal of whether space-time block-coding-based transmit diversity encoding of the base station is being used.

20 16. The system of claim 13 wherein the cell search unit uses, among channels transmitted from the base station, a common pilot channel to detect the frame timing information and the scrambling codes of the base station.

17. The system of claim 13 wherein the pilot symbol patterns used by the depatternization unit are orthogonal to one another.